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EPOCH

**Excellence in Processing Open
Cultural Heritage**

Network of Excellence

Information Society Technologies

D4.2.1: Report on Standards

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PIN

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

1. Introduction

The activity of WP4.2 is defined in the TA and Attachment I as addressing “*two distinct sub-areas – technical standards, including archive standards, defining particular ICT functionality and methodological standards, providing frameworks to address issues such as quality control in the design process.*” WP4.2 activity concerning quality control, usability and accessibility is addressed by D.4.2.2. “Report on usability and accessibility”, while the present one considers only the first sub-area.

WP4.2 objectives, as far as technical standards are related, according to Attachment I, are the following:

- a) Create awareness and facilitate the adoption of standards within the network;
- b) Promote the adoption of standards in the CH world, in particular in national regulations;
- c) Fill gaps in standards definition by additional specifications;
- d) Liaise with standards committees;
- e) Produce guidelines;
- f) Feedback experience of integration showcases and common integrated infrastructure into standards commentary as appropriate;
- g) Where necessary, develop Cultural Heritage Profiles for appropriate standards allowing implementation dependencies.

In year 1, standards activity has concentrated on training and, above all, surveys. Tasks related to f) and g) above depend on showcase and Joint Infrastructure implementation, and will necessarily follow it. Objectives c) and partly b) require surveying present standards and national situations; e) comes after the standards situation has been assessed.

A major task of the WP has consisted in fostering the approval of the Ename Charter. As is well known, the Ename Charter concerns the communication of cultural heritage and is one of the grassroots of EPOCH. The Charter was firstly established at a Conference in Gent in 2002 after preliminary work by the Ename team and since then has been considered by ICOMOS for adoption. This has implied discussion by national or regional ICOMOS chapters where the ENAME staff, acting as EPOCH delegates, have actively participated. Such initiatives have continued in year 1, culminating in a panel session at VAST.

2. Training

Training activity on standards has taken place at major EPOCH events i.e. CAA and VAST Conferences. There have been 3 tutorials, 1 at CAA and 2 at VAST, attended by some 100 people in total. Tutorials have dealt with documentation standards (two) and graphic standards (one).

The documentation tutorial was given at CAA2004 (April 2004) and at VAST (December 2004) by Steve Stead of Paveprime (EPOCH partner no. 61). It gave attendants an introduction to the CIDOC-CRM. As is well known, CIDOC-CRM is a Conceptual Reference Model for Cultural Heritage Documentation, in particular museum collections. The CIDOC-CRM is an ISO recommendation and, besides being an ISO recommendation, is being progressively accepted as “the” standard for Cultural Heritage. Nonetheless, perhaps for its theoretical approach and complexity, it still encounters some resistance for adoption by heritage professional. Its limited number of implementations is determined on the one hand by the relatively low confidence museum professionals have in it, and on the other by the fact that it is “difficult to implement”. This creates a vicious circle that EPOCH endeavours to break. A substantial point in this strategy is a clear explanation of its approach and the provision of examples. EPOCH tutorials follow a tested model that Steve Stead has used for some time, and they are always attended with interest.

One of the core issues concerning computer graphics is the OpenSG standard. It is well known that OpenSG is an Open Source, portable scenegraph system to create realtime graphics programs, e.g. for virtual reality applications, built on top of OpenGL. Presently, OpenSG is not adopted by all EPOCH partners, so it has been decided that a better knowledge of it would facilitate discussion and eventual acceptance as Network standard. For this reason, a one-day seminar was organized at VAST in December 2004. The lecturer was Cristopher Fünzig of the Technical University of Braunschweig (EPOCH partner no. 19).

Training material for tutorials is currently being revised by lecturers and is due to be available soon for download from the web site. However, user feedback, especially from the documentation tutorial, confirms that a specific archaeological perspective and implementation examples (hard to find ready: the CIDOC-CRM team has been using as example for years the same photograph from the WW2 Yalta Conference...) would greatly facilitate training.

3. Surveys: why once more?

As already mentioned above, one of the first tasks EPOCH had to perform was an extensive survey of standards currently in use. We were aware that surveys have been performed several times recently and we expected to find in such previous activity many, if not all, of the answers we needed. It came out that indeed good work had been done before, for instance by the FP5-IST project EMII-DCF in November 2003. EMII-DCF focused on IPR management, but also considered in detail current documentation standards concerning several fields. The situation as they represent it, is described in the following chapter, but we can anticipate that their results, however well done, are unsatisfactory for our goals. Like many others, CIDOC-CRM included, they consider documentation standards only for the easy part, i.e. collection management and curatorship. In this field, as for libraries and archives, administrative and cataloguing goals have determined the need for standard documentation long before the advent of computers. In fact, cataloguing collections started some centuries ago, and, when computers came into use, early digital documentation standards were the straightforward encoding of manual ones already in use. Refinement and improvement came afterwards, and now the situation is rather advanced both on the human side (librarians and museum catalogue managers are well aware of the documentation issues) and on the solution side (good protocols are available). In the archaeological domain, on the contrary, documentation has been considered for a long time a sort of personal notebook, where each researcher took note of the advancement of his or her research to facilitate his or her final synthesis and remind him or her some details necessary for interpretation. What was communicated to the scientific community was a selection of finds, useful to support the interpretation and the archaeologist's conclusions. No part of the raw data was destined for communication, and perhaps neither for re-use by the author. This approach explains why archaeological *official* documentation is mainly inspired by administrative exigencies – cataloguing what is kept in the antiquity authority stores – because often when archaeological items enter a museum, they are considered as part of a collection and are re-catalogued. In these cases, the archaeological context of such objects is preserved only through the archaeologists' interpretation, with no support of the original excavation documentation. This situation started to change some years ago, when the availability of computer archives made it evident that they could be compared and re-used to obtain new results without further excavation. However the following quotation is still illuminating, though not recent (italics are ours).

There is a variety of factors which acts as a barrier between the archaeological profession and documentation standards in general. First, the concept of a single overarching documentation standard is distasteful to many archaeologists. Within our

discipline there is a clear cultural preference for having options about the best way to do any particular task.

Second, there is only growing awareness within the archaeological community about the barriers that exist for end users who are interested in making use of information collected during fieldwork. The case needs to be made that standardized documentation can significantly ease the barriers that prevent information uptake and reuse. Too often in the past field units have received the message that standardized documentation will help them in their work, and this message has not rung true with their experiences. Instead, the point is that clear documentation will make it easier for others to understand the importance of the archaeological.

Third, there is rarely a sense of ownership of, or responsibility for, information collected by archaeologists once it passes out of their hands. There is still too often a sense that a field unit collects information, and then when this body of data is complete it is transferred to museums for a quick archival death.

This third factor seems most paradoxical. In my work as Data Coordinator for the Archaeology Data Service, I am lucky enough to talk to people from all sectors of archaeology about why they collect the information they do and how it can best be preserved long term. The clear message is that the primary reason most archaeologists collect information is so that everyone can understand more about the past. If no one will ever want to know about a site in the future, there isn't a lot of point in doing the work in the first place.

The heart of this paradox seems to lie in a communication gap that exists between some field archaeologists and some museum curators. *Archaeologists are willing to make a priority of documenting their resources in a way compatible with museum IT strategies if these are flexible enough to allow them to get on with their own work at the same time, and doesn't increase their workload in the first place.* There is currently little understanding, however, of the kinds of information that museum curators include in their collections management systems and - far more importantly - why curators bother to include what they do. *There also seems to be little awareness within the museum community of the bewildering number of standards that are already used by field archaeologists.*

Standards Used by Archaeologists

So what types of standards are used? There is a wide array of standards available for use, ranging from documentation standards to terminology standards to project management standards. Some of these are formal, others are de facto. Taken with the number of different policies that units must work under – policies of national and local archaeological archives, funding agencies, government agencies, museums, and professional standards bodies – one begins to feel quite sorry for the besieged field archaeologist. A few examples should suffice.

Conclusions

The point of data collection, management, and preservation for archaeologists is to enable future access to, and reuse of, information. We're in the 1990s now, and we're in a New Britain (or so we keep hearing). Trendy concepts include national grids for lifelong learning and freedom of information. The phrase "the people's information" is lurking around the corner, waiting for its debut. Field archaeologists aren't immune to this new caring and sharing attitude, and in fact are keen to play their part. Standardized ways of describing this information will help us all, as will collaboration in creating documentation that is fit for a variety of purposes.

As it is clear from a sentence in the last paragraph, this is a passage from an 8-years-old paper (Alicia Wise, *Promoting Standards in Archaeology*, MDA *Information* Vol 3 No 1, Papers from the

Standards in Action Workshop, Churchill College, Cambridge, 1-3 October 1997 – also available at <http://www.mda.org.uk/info31aw.htm>) that still keeps its validity all over Europe, if not in UK:

In conclusion, the standards situation in archaeology is much more complicated than is usually perceived. For EPOCH goals, museum collection standards are important but not sufficient. To make the best of data, we need to find what standards best fit into EPOCH's pipeline concept, in order to guarantee that no double data acquisition is ever required to produce valuable cultural communication or, worst, that the process produces garbage because garbage is fed in at the start.

4. Museum standards

For this task we were facilitated, as already noted, by existing work done previously by others. The following list is a series of references to papers and other publications dealing with standards for cultural heritage, but mainly focusing on collections and museums.

4.1 General surveys on standards for cultural heritage

- [1] S. Granger, L. Harmsen e J.R. Hemsley, *MAGNETS Museum and Galleries New Technology Study*, December 1996. Survey on data standards: CIMI; CIDOC-ICOM, G7 Museum Project
- [2] Tony Gill, Catherine Grout and Louise Smith, *VADS information standards review*, (1997). List of specifications for most relevant standards for Cultural Heritage.
- [3] ARCHEOGUIDE: *Project progress report 01* (06/2000) <http://archeoguide.intranet.gr/papers/ProgressReports/AGProgressReport01.pdf> Includes a survey on various protocols (XML, VRML) and Cultural Heritage Database specifications (CIDOC, Getty, ICCD) concerning standards on archaeological and museum documentation.
- [4] The *ADS page on archaeological and related standards* (mainly UK focused with additional information for international standards): <http://ads.ahds.ac.uk/project/userinfo/standards.html>
- [5] EMII-DCF *Framework report*, 2003. <http://www.mda.org.uk/spectrum.htm>. An extensive report by an FP5-IST Accompanying Action project. The report is focused on IPR but also considers standards for museum documentation.

4.2 Recent papers on CIDOC-CRM

- [6] M. Doerr The CIDOC conceptual reference module: an ontological approach to semantic interoperability of metadata, *AI Magazine* 24(3), 2003, 75 - 92 . ISSN:0738-4602
- [7] G. Scali and F. Tariffi *Bridging the collection management system-multimedia exhibition divide: a new architecture for modular museum systems*. www.spacespa.it/openheritage/public_downloads/BMCD-04.pdf A museum data management system, the paper is the outcome of OpenHeritage, an FP5 IST project. On the same subject see also the following one.
- [8] G. Scali and F. Tariffi *Beyond the multimedia database concept: a Cultural Heritage-specific Application Server*, http://www.spacespa.it/openheritage/public_downloads/CHAS-04.pdf

- [9] M. Pasquinucci, O. Signore, *La ricerca archeologico-topografica e l'elaborazione dei dati: linee guida per la redazione della Carta archeologica della Toscana*, in R. Francovich, M. Pasquinucci, A. Pellicanò (eds.), *La carta archeologica fra ricerca e pianificazione territoriale. Atti del Seminario di Studi organizzato dalla Regione Toscana, Dipartimento delle Politiche Formative e dei Beni Culturali*, Firenze, 2001. (in Italian) Generic statement of CIDOC-CRM compliancy of data structure, relating to the official Italian Archaeological Map.
- [10] Minerva Workshop, Rome July 2004 “Knowledge representation in the cultural semantic web” <http://www.w3c.it/events/minerva20040706/> (in Italian)
Papers somehow related to CIDOC-CRM and archaeological standards:
- P. Moscati *Metadati e ontologie per la ricerca e la comunicazione in archeologia* (apparently unrelated to CIDOC-CRM, describes a previous experiment with a proprietary tagging system)
- O. Missikoff *Il ruolo delle core ontologies nel ciclo di vita del prodotto culturale digitale: il caso CIDOC-CRM* (an introductory explanation, not even the best available, to CIDOC-CRM; student work)
- [11] T. Gill *Using the CIDOC CRM: RLG's Cultural Materials Initiative*, Research Libraries Group, Inc. www.rlg.org/en/downloads/2002metadata/gill/tsld001.htm
- [12] T. Gill *Making Sense of Cultural Infodiversity: The CIDOC Conceptual Reference Model* Tony Gill Research Libraries Group, Inc. Both dealing with museum applications.
- [13] R. Thornes and J. Bold (eds) *International Core Data Standard for Archaeological Sites and Monuments*, in *Documenting the Cultural Heritage*, Edited by The Getty Information Institute, 1998. <http://www.object-id.com/heritage/contents.html>. Sensible, but general, considerations.
- [14] P. Cripps and K. May *To OO or not to OO? – Revelations from defining an ontology for an archaeological information system*, paper presented at. CAA2004 Prato, Italy, in press. Preliminary work for an useful application, see also [19] and below, chapter 6.
- [15] Chun-Xia Zhang, Cun-Gen Cao, Fang Gu, Jin-Xin Si, *Domain specific formal ontology of archaeology and its application in knowledge acquisition and analysis*, May 2004 Journal of Computer Science and Technology, Volume 19 Issue 3. From the abstract, it appears to be technology-driven more than applications-driven.
- [16] J. Hunter, B. Koopman and J. Sledge, *Software Tools for Indigenous Knowledge Management*, 2003. <http://eprint.uq.edu.au/archive/00000093/01/koopman.pdf> A tool based on CIDOC-CRM for interoperability.
- [17] J.C. Holmen, C.-E. Ore, O. Eide *Documenting two histories at once. Encoding text and performing archaeology on archaeological texts archives*, DRH 2003. Report on the Museum Project (Norway).
- [18] J. Hunter, *Combining the CIDOC CRM and MPEG-7 to Describe Multimedia in Museums*, Museum and the Web 2002 <http://www.archimuse.com/mw2002/papers/hunter/hunter.html> Metadata model, CIDOC-CRM based, for the description and sharing of multimedia resources of cultural institutions.

Papers available at http://cidoc.ics.forth.gr/technical_papers.html (only those appeared in 2004 are quoted here).

- [19] P. Cripps, A. Greenhalgh, D. Fellows, K. May, D. Robinson *Ontological Modelling of the work of the Centre for Archaeology*, September 2004. An extension of [14], see also chapter 6.
- [20] Ermert, J. Gottschewski, M. Hagedorn-Saupe, H.-J. Hansen, R. Heuchert, C. Saro, R. Scheffel, G. Schulte-Dornberg, R. Stein, *Das CIDOC Conceptual Reference Model: Eine Hilfe für den Datenaustausch?* Deutscher Museumsbund Fachgruppe Dokumentation, Arbeitsgruppe Datenaustausch, October 2004. This paper reports about the experience of the German Museum Union (Deutscher Museumsbund) in using the CIDOC CRM:
- [21] Tony Gill *Building semantic bridges between museums, libraries and archives: The CIDOC Conceptual Reference Model*
- [22] Martin Doerr, Athina Kritsotaki, Stephen Stead *Which Period Is It? A Methodology To Create Thesauri Of Historical Periods*. Presentation given at CAA 2004 in Prato, Italy, now in press. A schema (in a form of DTD) that describes the process of data submission (which improves and updates the contents of the thesaurus). A submission contains a proposal for one or more changes of a period thesaurus.
- [23] Martin Doerr, Maria Theodoridou, Kurt Schaller *Integration of complementary archaeological sources*. Presentation given at CAA 2004 in Prato, Italy, in press. Interesting paper concerning epigraphic sources.
- [24] Nicholas Crofts, *Combining data sources – prototype applications developed for Geneva's department of historical sites and monuments based on the CIDOC CRM*. This paper describes a practical application of the CIDOC-CRM in integrating a large and diverse set of data sources.

It appears from the above bibliography that few of the CIDOC-CRM related papers deal with implementations, and except [14] and [19] which both deal with the same issue, practically none exists a museum framework (the only exception, though related to a specific application, is [23]).

The previous considerations in no way mean that museum collections are irrelevant for EPOCH. For this reason the following list of documentation standards, abridged from the EMII-DCF final report, is very useful for our work.

4.3 Museum standards

According to EMII, standards “define procedures (a type of administrative metadata) and units of information in a specific discipline in the cultural sector. The standards do not necessarily give guidance about its technical implementation. Procedural standards can be seen as defining ‘good-practice’ in a specific field. Descriptive standards focus on the definition of units of information. Sometimes procedural and descriptive standards are combined.”

4.3.1 SPECTRUM

SPECTRUM – The UK Museum Documentation Standard, 2nd Edition

Creator Cowton, Jeff (ed)

Publisher mda

Date 1997

Bibliographical reference 1 900642 01 8 (ISBN)

Web reference <http://www.mda.org.uk> (mda website)

Rights Copyright mda. All rights reserved.

[Open Standard]

Description Standard for the collections management documentation. Built around 20 procedures that commonly occur in museums. Supported by definitions of ‘units of information’ – the data needed to support the procedures.

Subject documentation (museums)

4.3.2 CDWA

CDWA – Categories for the Description of Works of Art

Creator Art Information Task Force

Publisher Getty Research Institute

Date 1990

Web reference <http://www.getty.edu/research/institute/standards/cdwa/index.html>

Rights Getty Research Institute.

Description The CDWA describe the content of art databases by articulating a conceptual framework for describing and accessing information about objects and images. They identify vocabulary resources and descriptive practices that will make information residing in diverse systems both more compatible and more accessible. They also provide a framework to which existing art information systems can be mapped and upon which new systems can be developed

Subject documentation (museums)

4.3.3 Dublin Core

The Dublin Core Element Set Version 1.1

Creator Dublin Core Metadata Initiative

Publisher Dublin Core Metadata Initiative

Date 1999

Web reference <http://dublincore.org/documents/1999/07/02/dces/>

Rights [Open Standard]

Description The Dublin Core is a simple metadata element set intended to facilitate discovery of electronic resources. Elements can be grouped into those having data on: Content - Coverage, Description, Type, Relation, Source, Subject, Title; Intellectual Property - Contributor, Creator, Publisher, Rights; Instantiation - Date, Format, Identifier, Language. Its use has been mandated by several governments in Europe (e.g. UK) and throughout the world (e.g. Australia).

Subject resource discovery

(we include here Dublin Core though not directly related to museums for his wide diffusion in the heritage sector).

4.3.4 TEI / Guidelines for Electronic Text Encoding and Interchange

TEI P4: Guidelines for Electronic Text Encoding and Interchange

Creator Sperberg-McQueen, C.M. (ed), Burnard, L. (ed)

Publisher Text Encoding Initiative Consortium

Date 2000

Web reference <http://www.tei-c.org/P4X/>

Rights Copyright (c) 2001, TEI Consortium

[Open Standard]

Description Defines a set of tags (markers) for inserting into the electronic form of a document (a text) in order to identify the structure and other features of that document. The aim of these tags is

to allow the processing of the text by computer. They are aimed at use with texts in any ‘natural’ language, of any date and of any genre. This version is XML-compatible. TEI Lite: is a “light” version of TEI (see: <http://www.tei-c.org/Lite/>).

Subject text encoding

(TEI is included here as the main text-encoding standard. However it is text-oriented and probably unsuitable for our goals).

4.4. Monument standards

4.4.1 MIDAS

MIDAS: A Manual and Data Standard for Monument Inventories

Creator English Heritage

Publisher English Heritage

Date 2000 (latest edition)

Web reference <http://www.english-heritage.org.uk/Filestore/nmr/standards/Midas3rdReprint.pdf>

Rights Crown copyright

Description MIDAS is an agreed statement of best practice for the compilation of inventories of monuments. It has been developed for all those who hold, or plan to develop, an inventory to record monuments, as heritage professionals, local authority managers, and so on.

Subject monuments

5. Archaeological standards

Notwithstanding the claims by CIDOC-CRM supporters that there is an international standard, that is CIDOC-CRM, no such thing in fact exists. There exists, on the contrary, a plethora of national archaeological standards. Sometimes they are enforced by national regulations, as is the case in Italy, with ICCD forms examined below; or in the Netherlands, with KNA regulations, for which “an important impulse to standardising the way finds and documentation are dealt with is encapsulated in the Dutch Archaeology Quality Standard (KNA). These standards are currently being developed and defined in more concrete terms. The implementation of these standards is still in an initial phase.” (Archaeological report 2002 by ROB, the Dutch National Service for Archaeology: <http://www.archis.nl/aB2002/ABeng/D300.htm>).

In several other cases there is no national provision of a “standard” documentation system.

Often regulations are described in the typical legal way, that is with reference/modifications to previous norms, and descriptions are difficult to find, exist only on paper and so on. Reconstructing archaeological documentation regulations may be an “archaeological” investigation by itself!

In almost all cases, regulations are interpreted by individual archaeological researchers in the most diverse ways and lead to as many documentation standards as archaeologists, for instance by adding some field in forms, systematically not filling others, albeit prescribed, etc.

It must be noted that if one does not limit one’s attention to Europe, there is an archaeological documentation system which is expanding in the USA, called XSTAR.

XSTAR (<http://oi.uchicago.edu/OI/PROJ/XSTAR/XSTAR.html>) has been developed at the Oriental Institute, University of Chicago. It seems that some kind of nation-wide endorsement or support is imminent; anyway, the system is now also being used outside the home institution. The relations between the CIDOC-CRM team (mainly European) and the XSTAR team (mainly US) are formally correct, but off-records they strongly criticize each other. On one hand, XSTAR is accused “to be a mess” (unfair) and to have no good theoretical foundations (partially true). On the other, CIDOC-CRM is charged with the accusation of being difficult, excessively formal and not taking into account practical exigencies, as shown by the low number of implementations compliant with it

(true); of being unsuitable for archaeological excavations (at present, true, but possibly things may change); and – a subtler criticism – of claiming to be the ultimate solution to archaeological documentation needs, which is strongly argued as theoretically impossible by some scholars of the so-called post-processual school. Post-processualism, the most representative scholars of which are, among others, Ian Hodder (formerly at Cambridge, now at Harvard), Mark Leone (U. of Maryland) and Ruth Tringham (U. of Berkeley), maintains that multi-vocality, subjectivism and involvement of local population are key issues in archaeological investigation. After an initial rejection of computer use, post-processualists have discovered that multimedia are substantial in documenting on-going archaeological work, because they allow respect of the above features. Some post-processualists are inclined to refuse in principle any globalization in documentation, as proposed by international standards, which in their opinion tends to flatten diversity (reasonable objection, but too radical: possibly there are documentation systems that take into account such requirements but are accepted by a wide scientific community). Therefore they do not trust CIDOC-CRM.

Some of the above criticism towards CIDOC-CRM is agreed also on this side of the Atlantic Ocean, and a sometimes prescriptive attitude of CIDOC-CRM people does not favour consent and spontaneous acceptance.

In sum, it is a real confusion. Our proposal for escaping from it and fostering standards adoption is the following:

- Survey one or more national archaeological regulations;
- State them in a clear and computer-oriented way;
- Check their compliancy with CIDOC-CRM;
- Define procedures and guidelines for doing the job, applicable in other cases as well: for example, to de-facto standards or individual, non-standard documentation systems.
- Map other “standards” to CIDOC-CRM and showcase that this creates no additional problems, on the contrary gives the advantages of interoperability.


6. Describing archaeological documentation systems

A clear description of current archaeological “standards” is the key for understanding them, comparing and evaluating pros and cons. The proposed methodology for this job has been developed by Paul Cripps et al. in the above quoted papers [14] and, more extensively, [19]. They applied this system to the English documentation system, providing a mapping to CIDOC-CRM, that is a definition of relevant categories in the English Heritage standard according to CIDOC-CRM and entities and properties. Below is a sample of Cripps’ mapping, referring the EH entity “site” to the CRM entity “E27” and establishing relations for it.

<i>Archaeological Site - EH_E0002</i>			
Concept	Site	CRM entity	E27: Site
Notes	The notion of an archaeological site as a material feature on the earth irrespective of spatial bounds e.g. Stonehenge. Provides a means to relate projects carried out at a particular site, even where the interventions or survey work have not been at the same spatial location. For example, excavations at one end of the West Kennet Avenue can be seen to be related to excavations at the other, even though they are some distance apart and may not be within the defined extent of the avenue as recorded in the SMR.		
Relationship	To	Notes	
P59: has section	AOI	The area being investigated by the current project can be seen to be a section definition of the whole site e.g. the north-west Quadrant of the henge at Avebury.	

In practice, this work builds a subset of the CIDOC-CRM identifying its entities with previously used concepts. The mapping builds on a pre-existing well-documented national standard, which is not always the case.

Let us consider now the case of Italy, where there is a national Institute of the Ministry of Cultural Heritage, ICCD (Central Institute for Documentation and Cataloguing) that has developed forms for documenting archaeological excavations. One of these forms, the one for the Stratigraphic Unit (also called in UK terminology, the "context"), is one of the layers composing the excavation stratigraphy; it appears as follows.

US	N. CATALOGO GENERALE	N. CATALOGO INTERNAZIONALE	 MINISTERO PER I BENI CULTURALI E AMBIENTALI ISTITUTO CENTRALE PER IL CATALOGO E LA DOCUMENTAZIONE				
	09/00183700		SOPRINTENDENZA ARCHEOLOGICA della TOSCANA				
LOCALITA	ANNO	AREA	SAGGIO	SETTORE/I	QUADRATO/I	QUOTE	UNITA STRATIGR.
Settefinestre	1978		XXIV			min. + 30 max. + 90	8
				AMBIENTE 34, 35, 1, 36, 37			NAT. ART. X
PIANTE	SEZIONI	PROSPETTI	FOTO		TABELLE MATERIALI 5-10		
3	1, 3, 5 EO; 2, 6 NS				RA 09/00174764-766 N		
DEFINIZIONE E POSIZIONE: Strato di accumulo naturale posto sui due terzi Ovest del saggio, corrispondenti agli ambienti indicati.							
CRITERI DI DISTINZIONE: Variazione di colore, consistenza e composizione							
MODO DI FORMAZIONE: Sedimentazione							
COMPONENTI	INORGANICI			ORGANICI			
	- pietre di calcare cavernoso di piccole e medie dimensioni - frammenti ceramici e metallici - calce			resti carbonizzati			
CONSISTENZA		COLORE		MISURE			
Friabile		Marrone		Si veda piante 3			
STATO DI CONSERVAZIONE: Alterazioni da radici							
DESCRIZIONE: La superficie (interfaccia) dello strato si presenta inclinata verso N con un andamento graduale. Per lo spessore si vedano le sezioni indicate. Il confine (interfaccia) con le US sottostanti è abbastanza netto. La terra è piuttosto granulosa, mista a radici. L'inclinazione del terreno dell'area a S del saggio, non è tale da permettere di ipotizzare un dilavamento di materiali da quell'area. Il grado di frammentarietà dei reperti è basso. La presenza di un vaso intero e di frammenti di considerevoli dimensioni indica che il terreno non è stato particolarmente danneggiato da fenomeni di erosione o da agenti atmosferici. I reperti all'interno dello strato sono disposti in modo piuttosto uniforme.							
SEQUENZA FISICA	UGUALE A		SI LEGA A		POSTERIORE A		
	GLI SI APPOGGIA		SI APPOGGIA A		124		
	COPERTO DA		COPRE		ANTERIORE A		
	1		22, 26, 71, 61, 41, 101, 27, 99, 29, 120		52		
	TAGLIATO DA		TAGLIA				
52							
RIEMPITO DA		RIEMPIE					
		in parte 91					

The above image does not refer to an old report, but is still rather common. It is a paper form, whose fields are typewritten.

The form continues on the back as shown in the next picture.

OSSERVAZIONI		
L'unità stratigrafica, dopo essere stata individuata , è stata scavata integralmente.		
INTERPRETAZIONE		
Si tratta di uno strato di accumulo naturale di terra mista a frammenti ceramici e metallo. La presenza di una certa quantità di reperti di età classica, insieme a materiale moderno, farebbe pensare ad una frequentazione sporadica del luogo, dopo la distruzione della villa, dove permanevano, al momento del crollo dell'edificio, una certa quantità di materiali relativi al periodo di occupazione della villa. I reperti contenuti in questo strato andranno quindi utilizzati nell'esame complessivo dei materiali collegati all'utilizzo dell'edificio. La posizione superficiale dello strato inoltre, poco al di sotto dell'humus, fa riflettere sulla presenza di materiali moderni, da mettere forse in relazione con le ripetute arature del terreno in questa zona. La presenza di ceramica smaltata databile tra il XVII e il XVIII secolo fa pensare ad una frequentazione sporadica del luogo in quel periodo.		
ELEMENTI DATANTI		
Tra materiali ceramici di età classica sono presenti frammenti di ceramica africana da mensa e da cucina e di anfore databili a partire dal II secolo d.C. (fino a tutto il IV secolo d.C.). Tra i materiali moderni è presente un frammento databile tra il XVII e il XVIII secolo e alcuni frammenti databili al XX secolo.		
DATAZIONE XVII - XX secolo d.C.	PERIODO O FASE III	
DATI QUANTITATIVI DEI REPERTI		
Terra sigillata africana 15		
Pareti sottili 10		
Lucerne 4		
Vernice rossa interna 1		
Ceramica africana da cucina 3		
Ceramica comune 109		
Anfore 35		
Metallo 3 chiodi in ferro, 1 lamina di bronzo		
Ceramica postclassica: invetriata 1; ingubbiata e invetriata 2; smaltata 1		
CAMPIONATURE	FLOTTAZIONE	SETACCIATURA
AFFIDABILITÀ STRATIGRAFICA Buona	DIRETTORE A. Carandini	RESPONSABILE D. Manacorda - A. Ricci

This filled form is provided by ICCD as a guide to forms use, and is signed by three famous Italian archaeologists.

The first task for us was to document every field with a method similar to Cripps' one but without assigning yet the CIDOC-CRM equivalent.

Below is the description of the "site" concept, analogous to the one already described for English Heritage. It adds to the EH template a field "proposed by" to take into account the form variability. Several scholars have introduced variants, to fit with special exigencies or to adapt the form to additional cases (for example vertical stratigraphy, i.e. referring to standing structures). Whenever possible, the original source is referred or, at least, the scholar (or school) who proposed the concept is quoted.

ENTITY	CONCEPT		CRM-ENTITY
AIE_05_SITO	Site of archaeological investigation		
FIELD PROPOSED BY	ICCD - F. Parise Badoni, M. Ruggeri Giove (eds.), <i>Norme per la redazione della scheda del saggio stratigrafico</i> , Roma, Multigrafica, 1984		
DEFINITION	The place where an archaeological investigation, excavation or survey took place, indicated by the appellation of the place (place-name) or by an alphanumeric identification code. Used in forms: US, USM, RA.		
RELATION	TO	NOTES	
PROPOSAL DATE	22/01/2005	MODIFICATION DATE	21/10/2005

Greyed fields refer to mapping to CIDOC-CRM, which will be undertaken in a subsequent stage. It may then happen that one concept splits into two or three: for example, the Stratigraphic Unit will possibly generate a space CRM entity (the SU location), a conceptual or physical object (the SU content) and a document (the SU form).

The work has been completed for the most important forms of the Italian documentation system and is ready for proceed to CRM mapping.

The complete description as yet produced is a 60-page volume currently being revised for correct translation into English of definitions in Italian. It is not only a matter of correct language translation, but problems mainly come from the definition of equivalent archaeological terms. In some cases they are non-existent and require an additional analysis which is usually carried out by a joint team of PIN (EPOCH partner no. 2) and University of Kent (EPOCH partner no. 52).

During year 1 these two partners had a series of periodic meetings together with CISA (EPOCH partner no. 98), UNIREL (EPOCH partner no.76) and University of Oslo (EPOCH partner no. 39) to define the present strategy and verify work progress. The first one took place in July in Prato at PIN; the second one took place in Brussels during VAST, in early December; the third one took place in Canterbury at the end of January 2005 and a fourth is planned to take place during CAA2005.

7. Conclusions and further work

The length, fatigue and delays of the first year's work have shown how difficult is to communicate for researchers sharing the same activity field but not used to share raw data. As already noted, the absence of multi-lingual thesauri has slowed down internal communication: during workshops, often people had to stop their presentation and explain a concept, based on other concepts that also need explanation, in a recursive way.

There is a case that is famous among the teams involved in WP4.2; it is the case of a field called "nastrino" (literally "small ribbon", a detail of stone work) that nobody was able to translate. In the end, after about an hour of attempts at an explanation, a drawing solved the issue, only to discover that this detail was not taken into account by English archaeologists, who therefore had created no word for it.

The creation of multi-lingual thesauri appears therefore a much needed, but difficult and lengthy task.

Many aspects taken for granted at the beginning have needed to be discussed again. Standards appear now more a methodological issue than a merely technical one, as the “nastrino” anecdote shows. However, a big step forward has been performed with the description methodology and the completion of the description of a national documentation system outside UK. It was not obvious that this could be done in a clean way, because of the many apparent redundancies and the inappropriate design, suitable for paper forms but not adapt for computer data management.

It is planned to extend a similar methodology to other “local” standards and complete for them a similar bi-lingual formal description. One of the candidates is Romania, where the local partner CIMEC (EPOCH partner no. 74) is willing to be involved. Norway is also interested; they have no such national system, and de facto or customary standards will be documented instead. Other partners are expected to join the party in the next months.

A planned meeting with Eastern Europe partners has been postponed to CAA2005, taking place immediately after the end of year 1. All the interested parties intend to attend this Conference (in fact meeting in person all together for the first time after CAA2004), and such a postponement will save everyone travel money, with no perceivable negative effect.

APPENDIX A. Actions planned to improve the standards activity.

1. Documentation standards

In this area the preliminary analysis carried on in year 1 has evidenced the need of performing an additional in-depth survey concerning the use of standards a) in site and monument documentation and b) in museum and collection documentation. This will complement the survey on the most used international standards already completed.

The need of such work has been acknowledged, in particular, in view of the planned NEWTON AMA, concerning the creation of mapping methodologies and tools from existing de-facto standards to the CIDOC-CRM model. In addition work in the language technologies area of infrastructure is developing understanding and tools for the parsing and interrogating CIDOC-CRM encoded collections, in order to generate multi-lingual responses to queries.

It has been planned to ask two partners with particular experience on documentation standards, ADS and Oxford Digital, to carry on two surveys, on a) and b) respectively. Funding for these tasks has been included in the AMA budget. The partners in charge of such tasks will also collect the information coming from the other partners involved in AMA, reporting on their specific national situation.

Such survey will start immediately as soon as NEWTON projects will begin. Results are expected within 3 to 4 months from start.

2. Technological standards

In this area a preliminary debate has shown that the situation is moving fast. Although EPOCH does not aim at actively contributing to the definition of technical standards, it is necessary to watch the evolution in order to make the best choices for the Network's policies. EPOCH is committed to adopt internationally accepted standards and to promote their adoption by partners. This requires a thorough examination of the present panorama, not easy a job in a fast changing scenario.

Some participants to the internal discussion have complained the slow pace of tools development for X3D, which has the advantage of being an ISO standard; it has also been pointed out that Collada may be worth considering for the wide support it gains from the industry, especially in the entertainment and communication sector, and the immediate functionality it seems to guarantee on account of the support by the most popular 3D formats and modelers. Other people advocate the need of extreme caution before committing to a choice. The feasibility of the approach is currently being further investigated as part of the common infrastructure activity in workpackage 3.

A workshop on these issues is scheduled at VAST2005 in early November. It is expected that a survey of technological 3D standards will be committed to some partners, in order to provide a deeper insight and, if possible, operational recommendations to the Network by the next meeting, scheduled for early April 2006.